भारतीय मानक
Indian Standard

IS 1199 (Part 1) : 2018

ताजा कंक्रीट — नमूने लेना, परीक्षण एवं विश्लेषण पद्धतियाँ

भाग 1 ताजा कंक्रीट के नमूने लेना

(पहला पुनरीक्षण)

Fresh Concrete — Methods of Sampling, Testing and Analysis

Part 1 Sampling of Fresh Concrete

(First Revision)

ICS 91.100.30

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
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Cement and Concrete Sectional Committee, CED 02

FOREWORD

This Indian Standard (Part 1) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

Testing plays an important role in controlling the quality of cement concrete work. Systematic testing of the raw materials, the fresh concrete and the hardened concrete, is an inseparable part of any quality control programme for concrete. This helps to achieve a higher efficiency of the materials used and greater assurance of the performance of the concrete, in regard to workability, strength and durability. The test methods used should be simple, direct and convenient to apply. This standard was formulated with this objective in view.

This standard was first published in 1959. In this revision, it was decided to review and update the various existing test methods of fresh concrete taking into consideration the latest international practices and developments in this field in the country, and also introduced certain new test methods, wherever required. In the process, the various existing test methods covered in IS 1199 : 1959 'Method of sampling and analysis of concrete', have been revised. The revision of the standard is being brought out taking into consideration primarily the corresponding ISO standards while also examining the other best practices world over and in the country. In addition, test methods for determination of properties of new types of concrete like self-compacting concrete have been included, covering tests such as consistency, viscosity, passing ability and segregation resistance. Also, for better understanding and implementation, some of the other test methods which were spread over in other Indian standards have been brought together under the fold of IS 1199 as its various parts, such as the setting time of concrete by penetration method and, water soluble and acid soluble chlorides in mortar and concrete. This is with a view to making the standard complete in all respects, and rendering it a comprehensive source of provisions for testing of concrete and reference in other Indian Standards.

In this revision, IS 1199 has been split into nine parts. The other parts in the series are:

Part 2 Determination of consistency of fresh concrete
Part 3 Determination of density of fresh concrete
Part 4 Determination of air content of fresh concrete
Part 5 Making and curing of test specimens
Part 6 Tests on fresh self compacting concrete
Part 7 Determination of setting time of concrete by penetration resistance
Part 8 Determination of water soluble and acid soluble chlorides in mortar and concrete
Part 9 Analysis of freshly mixed concrete

This standard (Part 1) covers the procedures for sampling of fresh concrete.

This revision of the standard has been taken up to incorporate the modifications found necessary in the light of experience gained in its use and also to bring it in line with the latest development on the subject.

These test methods shall be applicable as and when published in place of the corresponding provisions given in IS 1199 : 1959 'Method of sampling and analysis of concrete'. IS 1199 : 1959 shall be superseded after the publication of all the parts of the standard.

Significant provisions in this revision are highlighted below:

a) Details on apparatus, such as scoop, containers, and thermometer have been covered.
b) Procedure for obtaining spot sample has been covered.
c) A detailed clause for the mixing, transporting and handling of samples has been included.
d) Clause on the sampling record has been elaborated.

(*Continued on third cover*)

Indian Standard

FRESH CONCRETE — METHODS OF SAMPLING, TESTING AND ANALYSIS

PART 1 SAMPLING OF FRESH CONCRETE

(First Revision)

1 SCOPE

This standard (Part 1) specifies procedures for the sampling of fresh concrete. The samples are used for the testing of properties of fresh concrete, or for making test specimens to determine the properties of hardened concrete.

NOTE — The provisions of this standard shall not be applicable to concrete with special applications, such as pervious concrete.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 4845, IS 6461 (Parts 1 to 12) and the following shall apply.

3.1 Batch — Quantity of concrete, mixed in one cycle of operations of a batch mixer or the quantity of concrete conveyed ready mixed in a vehicle, or the quantity of concrete discharged over 1 min from a continuous mixer.

3.2 Composite Sample — Quantity of concrete consisting of a number of increments, distributed through a batch or mass of concrete, which are thoroughly mixed together.

3.3 Spot Sample — Quantity of concrete taken from a part of a batch or mass of concrete, consisting of one or more increments that are thoroughly mixed together.

3.4 Increment — Quantity of concrete taken by the single operation of a scoop.

4 PRINCIPLE

4.1 Taking a Composite Sample

Concrete is sampled from a stream of moving concrete or from a pile, in a series of increments according to **6.1**. These increments are then thoroughly mixed together.

4.2 Taking a Spot Sample

Concrete is sampled from a stream of moving concrete or from a pile, at a single point. Spot samples are not representative of the batch and should not be used to cast strength specimens.

5 APPARATUS

5.1 Scoop, made from non-absorbent material not readily attacked by cement paste, with a size suitable for taking increments of concrete.

5.2 Containers, one or more containers, made from non-absorbent material (preferably made of metal) not readily attacked by cement paste, for receiving, transporting and remixing the concrete samples.

5.3 Thermometer, (when required), to measure the temperature of fresh concrete to an accuracy of ±1°C .

6 PROCEDURE

Whether a composite sample or spot sample is to be taken will depend on intended use of the sample. Spot samples are not representative of the batch and should not be used to make strength specimens.

For samples to be used for strength test, a minimum quantity of 0.02 m^3 will be essential. For other tests such as air content, temperature and determination of consistence, smaller size samples may suffice. The size of samples shall also depend upon the maximum size of aggregate.

NOTE — While sampling, prevent skin contact with fresh concrete by wearing suitable protective clothing, gloves and footwear. If wet cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay. Wash fresh concrete off the skin immediately.

6.1 Obtaining a Composite Sample

Ensure that the apparatus is clean and dampen it with a moist, but not wet, cloth prior to use. Using the scoop, take the required number of increments uniformly

distributed throughout the batch. When sampling from a stationary batch mixer or ready-mixed concrete truck, disregard the very first and the very last of the discharge (about 10 to 15 percent). When sampling from a falling stream, the increments shall be taken in such a way as to represent the whole width and thickness of the stream. If the batch has been deposited in a heap of concrete, take the increments, wherever possible, distributed through the depth of the concrete as well as over the exposed surface. Increments shall not be taken from parts of the concrete that appear to be segregated.

The increments shall be taken from at least four points. Deposit the increments into the container(s).

6.2 Obtaining a Spot Sample

Ensure that the apparatus is clean and dampen it with a moist, but not wet, cloth prior to use. Take the sample increment(s) by a scoop from the required part of a batch or mass of concrete. Deposit the increment(s) into the container(s).

6.3 Mixing, Transporting and Handling of Samples

The samples, obtained by either of the methods described above, shall be mixed thoroughly in non-absorbent container with shovel or by other suitable implement.

At all stages of sampling, transporting and handling, care shall be taken to protect the fresh concrete samples against contamination, increase or loss of moisture, excessive vibration, and against extreme variations of temperature.

The properties of fresh concrete change with time after mixing, depending upon climatic conditions, more so if the concrete contains admixture. This should be taken into account in deciding when test specimens are made and when tests are carried out.

It is recommended that the tests for slump, temperature, and air content should start within 5 min after obtaining the final portion of the composite sample. Complete these tests expeditiously. Filling of the specimens for strength tests shall commence within 15 min after thorough mixing of the composite sample.

6.4 Measuring the Temperature of the Sample

Whenever required, measure the temperature of the concrete in the container(s) at the time of sampling.

7 SAMPLING RECORD

The following information regarding the samples shall be included in the sample report:

a) Clear identification of the sample (sample number),
b) Type of sample (composite or spot),
c) Date and time of sampling,
d) Type and grade (if applicable) of cement and admixtures (if used),
e) Identification of the works which the sample represents,
f) Identification of the batch or truck mixer sampled,
g) Ambient temperature,
h) Temperature of the concrete sample (when required),
j) Any deviations from the standard method of sampling,
k) A declaration by the person responsible for sampling that the sample was obtained in accordance with this Indian standard, except as noted in (j), and
m) Name and signature of person responsible for sampling.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
4845 : 1968	Definitions and terminology relating to hydraulic cement	(Part 5) : 1972	Formwork for concrete
		(Part 6) : 1972	Equipment, tools and plant
6461	Glossary of terms relating to cement concrete	(Part 7) : 1973	Mixing, laying, compaction, curing and other construction aspects
(Part 1) : 1972	Concrete aggregates		
(Part 2) : 1972	Materials (Other than cement and aggregate)	(Part 8) :1973	Properties of concrete
		(Part 9) : 1973	Structural aspects
(Part 3) : 1972	Concrete reinforcement	(Part 10) : 1973	Tests and testing apparatus
(Part 4) : 1972	Types of concrete	(Part 11) : 1973	Prestressed concrete
		(Part 12) : 1973	Miscellaneous

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Cement and Concrete Sectional Committee, CED 02

Organization	*Representative(s)*
In Personal Capacity (*14A, Summer Breeze, Kuravankonam, Kowdiar, Thiruvananthapuram 695 003*)	Shri Jose Kurian (***Chairman***)
ACC Ltd, Mumbai	Shri S. A. Khadilkar Shri Raman Sadanand Parulekar (*Alternate*)
Ambuja Cements Limited, Ahmedabad	Shri J. P. Desai Dr Bibekananda Mohapatra (*Alternate*)
Atomic Energy Regulatory Board, Mumbai	Shri L. R. Bishnoi Shri Sourav Acharya (*Alternate*)
Builders' Association of India, Mumbai	Shri Sushanta Kumar Basu Shri D. R. Sekor (*Alternate*)
Building Materials and Technology Promotion Council, New Delhi	Shri J. K. Prasad Shri C. N. Jha (*Alternate*)
Cement Manufacturers' Association, Noida	Shri Rakesh Bhargava Dr S. K. Handoo (*Alternate*)
Central Public Works Department, New Delhi	Shri A. K. Garg Shri Rajesh Khare (*Alternate*)
CSIR – Central Building Research Institute, Roorkee	Shri S. K. Singh Shri Subhash Gurram (*Alternate*)
CSIR – Central Road Research Institute, New Delhi	Shri J. B. Sengupta Shri Satish Pandey (*Alternate*)
CSIR – Structural Engineering Research Centre, Chennai	Dr K. Ramanjaneyulu Dr P. Srinivasan (*Alternate*)
Central Soil and Materials Research Station, New Delhi	Director Shri N. Siva Kumar (*Alternate*)
Central Water Commission, New Delhi	Director (CMDD) (N&W) Deputy Director (CMDD) (NW&S) (*Alternate)*
Conmat Technolgies Pvt Ltd, Kolkata	Dr A. K. Chatterjee Shri Subrato Chowdhury (*Alternate*)
Construction Chemical Manufacturers' Association, Mumbai	Shri Samir Surlaker Shri Nilotpol Kar (*Alternate*)
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Hindustan Construction Company Limited, Mumbai	Shri Satish Kumar Sharma Dr Chetan Hazaree (*Alternate*)
Housing and Urban Development Corporation Limited, New Delhi	Shri Deepak Bansal
Indian Association of Structural Engineers, New Delhi	Shri Mahesh Tandon Shri Ganesh Juneja (*Alternate*)
Indian Concrete Institute, Chennai	Shri Vivek Naik Secretary General (*Alternate*)
Indian Institute of Technology Delhi, New Delhi	Representative
Indian Institute of Technology Madras, Chennai	Prof Devdas Menon Dr Manu Santhanam (*Alternate*)

Organization	*Representative(s)*
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(*Continued from second cover*)

In the formulation of this standard, assistance has also been derived from ISO 1920-1:2004 'Testing of concrete — Part 1: Sampling of fresh concrete'.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

In reporting the result of a test or analysis made in accordance with this standard, is to be rounded off, if the final value observed or calculated, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

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BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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